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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,582	08/07/2001	Robert A. Beach	Q105	2712

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EXAMINER

SINES, BRIAN J

ART UNIT	PAPER NUMBER
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1743

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/923,582

Applicant(s)

BEACH ET AL.

Examiner

Brian J. Sines

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/12/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5-20 is/are pending in the application.
- 4a) Of the above claim(s) 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

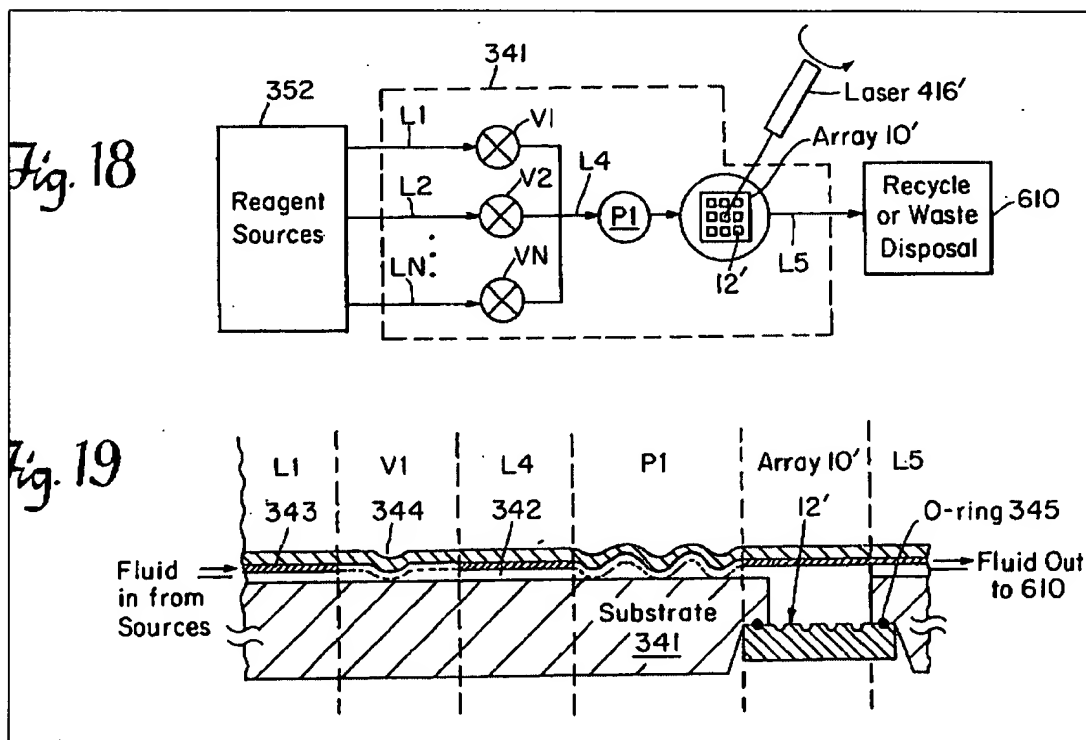
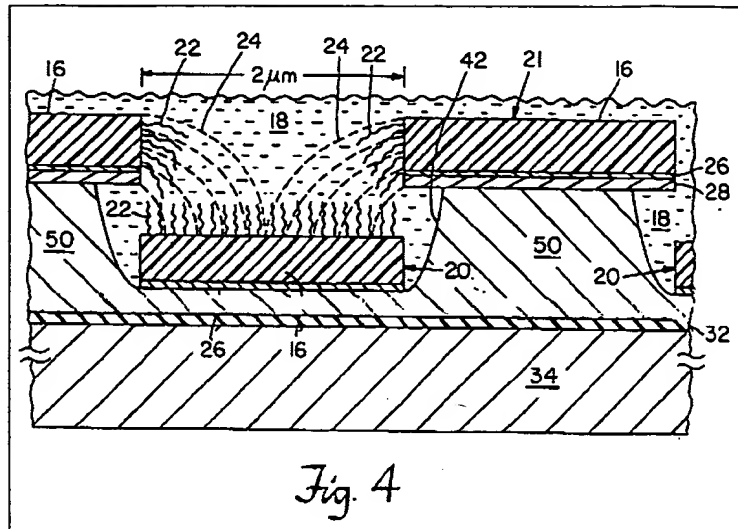
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis et al. (U.S. Pat. No. 5,653,939 A) (hereinafter "Hollis") in view of Thomas et al. (U.S. Pat. No. 6,444,474 B1) (hereinafter "Thomas").

Regarding claim 5, Hollis teaches an apparatus comprising: an integrated microfluidic peristaltic pump (P1); a plurality of analysis chambers (wells 42 formed in each test site 12' contained in array 10) in communication with the pump; and a plurality of analysis devices (i.e., a micromechanical resonator, surface acoustic or electromagnetic wave detector, or a monolithically integrated charge-coupled device (CCD), etc.), which test a fluid contained within the analysis chambers for an analyte (see col. 4, line 15 – col. 15, line 51; figures 1 – 6, 18 & 19).



Hollis is silent to specifically teaching the incorporation of an integrated LED. Hollis does teach the incorporation of an integrated optical detector, such as a monolithically integrated charge-coupled device (CCD) (see col. 8, lines 59 – 67). Hollis does teach the incorporation of a laser light source (416') for laser scanning of the test sites (see col. 14, lines 33 – 50). Thomas

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does teach the use of LED and laser diode light sources with a microfluidic analysis system (see col. 16, lines 36 – 45). Therefore, a person of ordinary skill in the art, as evidenced by Thomas, would have recognized the suitability of incorporating an integrated LED with a microfluidic analysis system for the same intended purpose of facilitating effective sample processing and analysis (see MPEP § 2144.07). Furthermore, these light emission and detection systems are considered functionally equivalent (see MPEP § 2144.06). The Courts have held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such a substitution obvious. See *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate an integrated LED, as taught by Thomas, with the analytical detection system, as taught by Hollis, in order to facilitate effective sample processing and analysis.

Regarding the recitation that the integrated LED and optical detector further comprise means tuned to an optical wavelength absorption line of an analyte, it is deemed obvious to a person of ordinary skill in the art to provide tuning means, such as for an appropriate light wavelength emission, so that the apparatus would function properly as intended in order to effectively detect the target analyte.

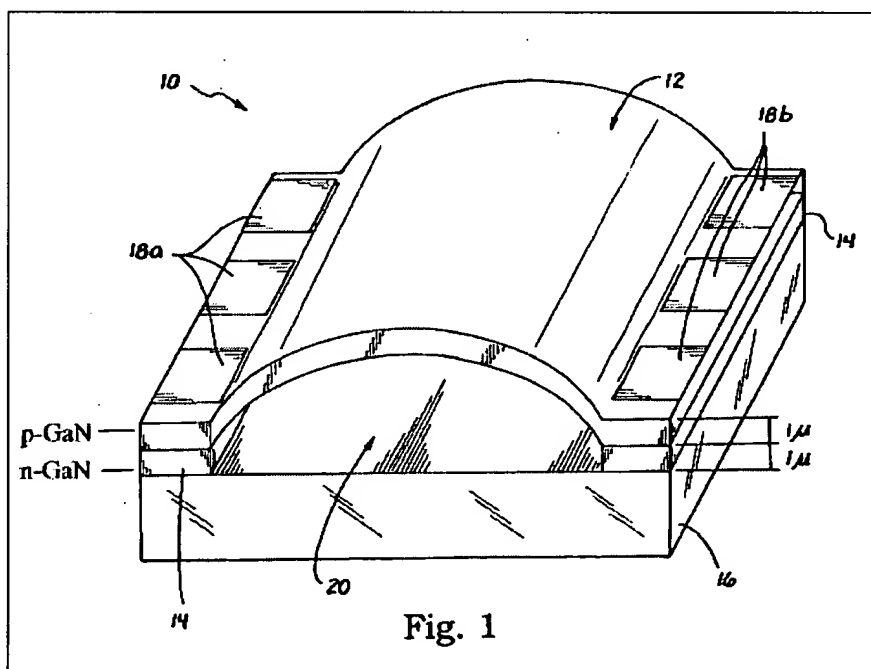
2. Claims 6 – 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis in view of Bridger et al. (U.S. Pat. No. 6,579,068 B2) (hereinafter “Bridger”).

Regarding claims 6, 7, 11, 12 & 14 – 17, Hollis teaches an apparatus comprising: an integrated microfluidic peristaltic pump (P1); a plurality of analysis chambers (wells 42 formed in each test site 12' contained in array 10) in communication with the pump; and a plurality of analysis devices (i.e., a micromechanical resonator, surface acoustic or electromagnetic wave

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detector, or a monolithically integrated charge-coupled device (CCD), etc.), which test a fluid contained within the analysis chambers for an analyte; (see col. 4, line 15 – col. 15, line 51; figures 1 – 6, 18 & 19).

Hollis does not specifically teach the incorporation of a micropump comprising the characteristics as recited. Bridger teaches a micropump comprising: a bowed electrodeformable membrane (12); pillars (14) composed of n-type GaN; a substrate (16) disposed below the membrane and coupled thereto; a microchannel (20) defined between the membrane and the substrate, wherein the microchannel comprises a longitudinal axis; and an electrode structure (e.g., opposing sets of metallic contact pads 18a & 18b) disposed on at least one side of the membrane along a side of the microchannel (see col. 4, line 62 – col. 6, line 53; figures 1, 4d & 4e). Bridger teaches that the disclosed micropump is suitable for micro-chemical or microfluidic analysis devices (see col. 7, lines 44 – 50).



Therefore, a person of ordinary skill in the art would have recognized the suitability of incorporating the micropumps disclosed by Bridger with a microfluidic analysis system for the same intended purpose of facilitating effective sample processing and analysis (see MPEP § 2144.07). Furthermore, as discussed above, both Hollis and Bridger disclose the use of micropumps with analytical microfluidic devices, which are considered functionally equivalent (see MPEP § 2144.06). The Courts have held that an express suggestion to substitute one equivalent component or process for another is not necessary to render such a substitution obvious. See *In re Fout*, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the micropump disclosed by Bridger with the analytical detection system, as taught by Hollis, in order to facilitate effective sample processing and analysis.

Regarding claims 8 & 13, Bridger teaches the incorporation of a drive circuit or conventional timing circuit for voltage application in order to operate the micropump (see col. 6, line 54 – col. 7, line 33).

Regarding claims 9, 10 & 14, Bridger teaches that the electro-deformable membrane consists of p-type GaN (see Abstract & col. 4, line 62 – col. 5, line 44).

#### ***Allowable Subject Matter***

The indicated allowability of claims 11 – 17 is withdrawn upon further review of the prior art and consideration.

#### ***Response to Arguments***

Applicant's arguments with respect to the pending claims have been considered, but are moot in view of the new ground(s) of rejection.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines, Ph.D. whose telephone number is (571) 272-1263. The examiner can normally be reached on Monday - Friday (11 AM - 8 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'BJS', is located to the left of the text block containing the PAIR system information.